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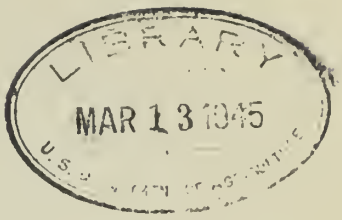

COOPERATIVE REORGANIZATION

OF

MILK AND CREAM HAULING

COOPERATIVE RESEARCH AND SERVICE DIVISION

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FARM CREDIT ADMINISTRATION

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SUMMARY

The critical situation in respect to trucks, tires, and tubes and the need for conserving gasoline and labor places a heavy responsibility on dairy cooperatives. These vital resources must be conserved in the interests of our war efforts and as a means of assuring continued hauling service to members.

Rubber-tired motor vehicles are scheduled to handle over 77 billion pounds of milk and cream in 1942. Under the present hauling arrangements this would involve the use of 128,500 trucks and they would travel the amazing total of over 2 billion miles. There is little doubt that the number of trucks and the road mileage can be reduced materially and still leave satisfactory hauling services. Numerous research studies show this to be the case, and several cooperatives have demonstrated that it is practical to attain substantial economies through a systematic job of planning and reorganization.

The first step to be taken in connection with reorganization of the hauling system is to obtain a complete picture of existing hauling arrangements. The next step is to plan the revised system so as to eliminate all waste, duplication, and unnecessary services. Savings will ordinarily follow from combining and consolidating loads, rerouting, limiting the service rendered, adjusting the frequency of service, and controlling self-delivery and exchange hauling. In many instances, a substantial conservation will be achieved only by reallocating producers among the various outlets. Likewise, this phase of the revised plans will undoubtedly encounter the greatest obstacles. It is believed many of these will be overcome when the potential savings in resources and reduced costs to producers are brought to light.

In laying out the revised plan, it appears best to start with an "ideal" arrangement recognizing only the location of the farms, the production of milk and cream on each farm, where the plants are located, and the road types. Starting with these data and the trucking equipment available, a complete assembly system should be laid out.

This "ideal" system, however, may not be practical enough in all aspects to permit complete adoption. Therefore, the plan should be appraised in terms of its workableness in view of local conditions. No plan is of use unless it can be put into operation. It is likely that concessions will have to be made in different directions. But these deviations should always be measured in terms of costs as compared with the "ideal" system.

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The paramount objective in revising the hauling structure is to conserve rubber and equipment. Market reform and other considerations are secondary. Thus, in putting the revised plan into operation, efforts should be made to obtain industry acceptance. Individual objections may be overcome by recognizing existing rights and equities and making appropriate settlements.

Cooperatives can be instrumental in bringing about improved hauling structures in various ways. All of these involve control over hauling. The solution may be in organizing trucking cooperatives, in formal hauling contracts with private haulers, or in taking over complete ownership of trucks. In any case, if cooperatives are to fulfill their responsibility toward this important problem, they must be ready to bring about significant changes in present hauling arrangements.

COOPERATIVE REORGANIZATION OF MILK AND CREAM HAULING 1/

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War conditions have thrown a strong spotlight on the local hauling or procurement of milk and cream. Already a vital though often neglected phase of the marketing of dairy products in the United States, hauling has become even more important under war conditions. The critical shortages of tires, tubes, and trucks, and the need for conserving gasoline and labor sharply emphasize the fact that milk and cream hauling arrangements are far short of maximum efficiency in most areas. Repeated research studies have shown clearly that this hauling could be done equally as well with fewer trucks, with less mileage traveled, and at a lower cost to producers. Farmers' cooperatives have proved in many areas that these savings can be made on a practical basis through a systematic job of planning and reorganization.

Under these conditions, one of the most tangible contributions which organized dairymen can make to the winning of the war is to help in every way possible to halt the needless consumption of the valuable resources being used in hauling milk and cream. Conservation plans need to be started immediately so that the existing equipment can be stretched over a much longer period of service, and so that new equipment directed to this use, if such equipment is available, can be held to the minimum. Such conservation programs will not only help to win the war by saving rubber and trucks for military use -- they will also insure dairymen and consumers of dairy products here and in other anti-Axis nations that satisfactory hauling service will be provided for some time to come. In addition, such programs will promote lower hauling charges to dairymen by making the system more efficient.

1/ This report was prepared by Louis F. Herrmann, Paul E. Quintus, and William C. Welden, Cooperative Research and Service Division.

The material contained in this report is designed primarily to assist farmers' dairy marketing cooperatives and other groups in their study and analysis of present hauling arrangements, and in their development of conservation programs. It is based largely on previous research studies of milk and cream hauling arrangements in various local market areas, and on information which has been accumulated regarding the experiences of cooperatives in this field. Of necessity much of the information is somewhat general in character, and some of the specific suggestions may not apply at all in particular areas. The general principles involved, however, should be applicable, and should provide a working guide for the study and formulation of hauling arrangements in various markets and production areas.

The Size of the Hauling Job

More and more in recent years the first stages in the marketing of milk and cream have been built around rubber-tired motor vehicles. With the expanded production goals for milk in 1942, it is estimated that over 100 billion pounds of milk or its equivalent in the form of cream will have to be moved to market. Actual pounds of product to be moved will probably be between 75 and 80 billion pounds, since much of the milk designed for butter manufacture will leave the farm in the form of cream (see table 1).

It is impossible to measure exactly the proportion of this volume which is transported by various methods. Undoubtedly most of it leaves the farm for the first assembly point in some type of rubber-tired motor vehicle -- farm truck, farm auto, retail delivery truck, small pick-up truck, or regular milk or cream hauling truck. This is especially true of the 72 or 73 billion pounds which will leave the farm in the form of whole milk.

Data in table 2 indicate some of the characteristics of hauling conditions which have been revealed by various studies. It is dangerous to generalize from these figures, but for illustrative purposes it might be assumed for the nation as a whole that the average milk truck carries 2,000 pounds, the average cream truck carries 1,000 pounds of cream, and the average producer-distributor truck carries 700 pounds of milk equivalent. If we assume further that the bulk milk trucks travel 40 miles per day, the retail trucks 40 miles, and the cream trucks 80 miles, we have a basis for estimating loads and mileages. Using these data gives the following national totals: (1) 90,000 milk trucks traveling 3,600,000 miles per day; (2) 11,000 cream trucks traveling 880,000 miles per day; and (3) 27,500 farmers' milk delivery trucks traveling 1,100,000 miles per day. Combined totals are 128,500 trucks and 5,580,000 miles per day. The mileage for the year, under these assumptions, is the amazing total of over 2 billion.

Table 1. Estimated quantities of milk and cream to be assembled in 1942 1/

Milk usage	Million pounds milk equivalent	Million pounds to be hauled	Million pounds daily average to be hauled
Producer-distributors for retailing	7,000	7,000	19.2
Whole milk for fluid use	29,000	29,000	79.5
Whole milk for butter, powder, and skim products	11,500	11,500	31.6
Whole milk for cheese	10,500	10,500	28.8
Whole milk for evaporated and condensed	9,000	9,000	24.7
Whole milk for miscellaneous products	6,500	6,500	17.8
Cream for butter	28,000	3,900	10.7
Total	101,500	77,400	212.3

1/ Based on 1942 production goals and data for previous years on the product use of the commercial milk supply, United States Department of Agriculture, Bureau of Agricultural Economics.

Table 2. Average loads carried on selected milk and cream country assembly routes

Investigator	Location	Date	Number of routes	Average daily load	Average length of route one way	Average cwt. per mile
				Pounds	Miles	
Milk						
Bartlett and Caskey (2) 4/	Dayton, Ohio, before revision	1930	14	1,835	30.2	1.22
Bartlett and Caskey (2)	Dayton, Ohio, after revision	1931	9	2,855	29.2	1.96
Welden and Stitts (24)	Dayton, Ohio	1935	37	3,200	3/ 16.9	1.89
Bartlett and Caskey (2)	St. Louis, Missouri	1933-34	244	1,321	20.3	1.30
Scanlan (19)	Philadelphia, Pennsylvania	1934	1/ 84	220	-	-
			2/ 136	1,834	27.8	1.32
Welden and Stitts (24)	Columbus, Ohio	1935	102	2,605	3/ 18.4	1.42
Welden and Stitts (24)	Portsmouth, Ohio	1935	11	2,900	3/ 13.7	2.12
Welden and Stitts (24)	Indianapolis, Indiana	1937	-	3,000	3/ 25.0	1.20
Welden and Stitts (24)	Fort Wayne, Indiana	1937	-	3,000	3/ 20.0	1.50
Welden and Stitts (24)	Chattanooga, Tennessee	1937	-	3,500	3/ 40.0	.88
Welden and Stitts (25)	Louisville, Kentucky	1937	71	3,600	3/ 26.3	1.37
Welden and Stitts (24)	Akron, Ohio	1935	61	4,199	3/ 18.2	2.31
Spencer (21)	New York	1924	1/ 204	302	2.5	1.21
Spencer (21)	New York	1924	2/ 59	2,140	3/ 6.85	3.12
MacLeod, Tennant and Corr(13)	Providence, Rhode Island	1941	50	4,380	40.1	1.09
Agricultural Adjustment Administration (1)	Milwaukee, Wisconsin	1934	169	4,880	29.0	1.68
Bressler and Hammerberg (4)	Hartford, Connecticut	1936	71	2,170	17.0	1.28
Cream						
Quintus and Robotka (17)	Iowa	1937	67	993	40.00	.50
McBride and Sherman (14)	Ohio	1932	126	1,212	80.00	.30
Quintus (Unpub. ms.)	Midwest	1940	23	-	88.3	-

1/ Self-haulers.
2/ Contract haulers.
3/ Average distance of producers from market.
4/ Numbers in parentheses refer to studies listed at the end of the report.

Actual mileage is probably in excess of this broad estimate, largely because of the large amount of self-hauling and exchange-hauling among farmers in their own small trucks or passenger cars. The percentage of self-hauling or exchange-hauling is as high as 30 percent at many country milk receiving stations and small markets. It is as high as 100 percent at many small local creameries. This hauling of small loads is partly offset, of course, by the fact that many regular milk and cream trucks are hauling much more than the average volumes used above.

If each tire is good for 50,000 miles and each truck good for 100,000 miles, then a conservation program which saves 25 percent will, in one year's time, save the full life of 40,000 to 60,000 new tires and the full life of 5,000 new trucks. Stated in different terms, such a program will mean that 30,000 to 40,000 trucks and sets of tires now used for hauling milk or cream can be withdrawn from service. They can be diverted to more essential uses or placed in reserve until the equipment which is left in use wears out.

How Much Can Be Saved by Replanning

There can be little doubt that in the vast majority of local market areas, milk and cream could be hauled from farms to the first point of assembly with far fewer trucks and with much less mileage than is now the case. Many thorough research studies have been made of this phase of marketing. They all show that completely adequate hauling service can be rendered with less equipment and less travel. They show that small trucks are being used where larger ones would be suitable, that trucks are not fully loaded, that adjoining routes overlap each other to an unnecessary extent, that excessive time is spent in giving special services that may not be necessary, and that routes serving particular plants or markets are extended much further than necessary. By correcting these conditions, it has been shown in these studies that tremendous reductions would be possible in the number of routes, in the number of trucks, and in the daily mileage necessary to provide the producers with complete hauling service.

In summary form, the results of a few of these studies may be cited to illustrate the nature and extent of potential savings. A recent study in Providence, Rhode Island (13) revealed that 25 larger trucks and 6 smaller trucks could haul the milk now hauled by 51 trucks of various sizes. The total daily mileage of all trucks could be reduced from 4,017 to 2,258 miles. In Lenawee County, Michigan, 310 miles of truck travel could be reduced to 142 miles by replanning, according to a recent study by the State Agricultural Experiment Station (23). In St. Louis a detailed study (2) in one section of the milkshed concluded that 26 routes with 852 miles of travel could be replaced by 13 routes covering a total of 541 miles. In an Iowa township where detailed records were secured (17), the route-mileage was 3 times the total mileage of roads, and it was estimated that

this mileage could be reduced 50 percent. A rerouting and replanning job around a receiving station in the Philadelphia milkshed (19) demonstrated that 6 trucks could now do the job previously done by 9 trucks, 4 exchange-haulers, and 6 self-haulers. Total mileage could be reduced from 256 to 158 miles. For Hartford, Connecticut, it was estimated in a recent study (4) that 29 trucks covering 1,540 miles per day could serve the entire milkshed, whereas nearly 100 trucks covering well over 3,000 miles per day have been engaged in milk collection for this market.

The results of some of these and other studies are summarized in table 3, to show the percentage savings possible through complete reorganization and replanning. This is further indicated by a more careful examination of more detailed figures for specific areas. Table 4, for example, shows the nature and rated capacity used in hauling to country plants in St. Louis in 1933-34. Rated capacity of these vehicles averaged 2,770 pounds. Actually on 244 of these routes the average load was only 1,321 pounds. Full rated capacity would permit more than doubling average loads, whereas loading beyond rated capacity, which is entirely feasible under ordinary conditions, would permit even further reductions.

Table 3. Summary of savings in trucks and mileage indicated by research studies

Market	Percentage saving in	
	Number of trucks	Miles of travel
Lenawee County, Michigan (23)		54
Milwaukee, Wisconsin (1)		1/ 16-20
San Francisco, California (22)	70	
Butler County, Iowa (17)		50
St. Louis, Missouri (2)	50	37
Dayton, Ohio (2)	36	38
Providence, Rhode Island (13)	39	44
Orleans County, Vermont 2/	40	51
Hartford, Connecticut (4)	71	49

1/ By merely eliminating duplication of collection mileage.

2/ Unpublished study by Alan MacLeod and others, New England Research Council, Boston, Massachusetts.

Table 4. Equipment used in transporting milk on commercial routes from farms to country plants, St. Louis milkshed, 1933-34 (2).

Equipment	Number of routes	Total rated capacity
		Pounds
Trucks		
1/4 ton	1	500
1/2 ton	24	24,000
3/4 ton	3	4,500
1 ton	38	76,000
1- 1/2 ton	197	591,000
2 ton	13	52,000
3 ton	2	12,000
3- 1/2 ton	1	7,000
4	1	8,000
Subtotal	280	775,000
Average		2,770
Other vehicles		
Autos	6	
Auto trailers	2	
Wagons	16	
Vehicles of unknown capacity	25	
Total	329	

Another study, covering cream routes in Ohio, showed similar conditions (see table 5). Total rated capacities of 67 trucks was 171,500 pounds, whereas the load being carried was about 127,000 pounds. Thus, over 25 percent of the rated capacity was idle, and an even greater proportion of the practical capacity was not being used.

Table 5. Sizes of trucks used in cream hauling in southwestern Ohio (14)

Size in ton capacity	Number of trucks	Total rated capacity
		Pounds
1/4 ton	4	2,000
1/2 ton	4	4,000
3/4 ton	2	3,000
1 ton	11	22,000
1- 1/4 ton	1	2,500
1- 1/2 ton	44	132,000
3 ton	1	6,000
Total	67	171,500

These facts are further illustrated by the data in tables 6, 7, and 8, showing progressive stages in the reorganization of hauling arrangements in Orleans County, Vermont. Table 6 contains descriptive information on arrangements at the time of the study. Table 7 illustrates, by comparison with the previous table, the changes which could be made without shifting any of the producers to another plant. The data in table 8 summarize the arrangements which would be possible through directing producers to deliver to the plant nearest their farm.

Table 6. Existing truck use and mileage for milk hauling in Orleans County, Vermont 1/

Type of truck	Number of trucks	Daily Mileage
Insulated van	6	344
Large stake (100 cans or more)	52	1,635
Small stake (less than 100 cans)	22	474
Pick-up	21	454
Total	101	2,907

1/ See footnote No. 2, table 3.

Table 7. Necessary truck use and mileage in Orleans County, Vermont following reorganization without shifting producers to nearest plant 1/

Type of truck	Number of trucks	Daily mileage
Insulated van	6	1,698
Large stake	52	
Small stake	4	57
Total	62	1,755

1/ See table 6.

Table 8. Necessary truck use and mileage in Orleans County, Vermont following reorganization and shifting producers to nearest plant 1/

Type of truck	Number of trucks	Daily Mileage
Insulated van	6	1,385
Large stake	52	
Small stake	3	36½
Total	61	1,421½

1/ See tables 6 and 7.

The more practical side of replanning and reorganization, of course, is putting the revised plans into operation. Few detailed records are available to show precisely what has been done following these studies, but some of the general results are known. In Dayton, Ohio, the farmers' cooperative association, following a detailed study, rerouted all trucks, reduced the number of trucks from 54 to 37, and reduced hauling rates. The association acquired by direct purchase the equity of haulers in their established routes, and took over complete control of hauling except for owning the trucks. Savings, during the first year under the revised plans, more than repaid the cost of purchasing equities.

The farmers' cooperative in Portland, Oregon, has gradually acquired ownership and operation of both of its milk and cream trucks. By 1939 it was operating 44 of the 55 milk trucks hauling to Portland. Average loads on its enclosed body milk trucks were 4,800 for the year, and as high as 5 tons or over on individual trucks in the flush season.

Many other associations have done outstanding jobs along this line, including those in Omaha, Louisville, and Des Moines. In most cases, control over the routes has been secured through hauling contracts or through lease arrangements, so that the cooperative may plan routes and designate conditions of service. In other cases, the producers on particular routes have organized separate cooperatives to own and operate their milk truck on a cost basis, or have organized informally and selected their hauler through competitive bids. Both procedures have been successful in particular areas.

The principal point is, however, that there is ample evidence that the haphazard and unplanned hauling systems which were allowed to develop in most areas can, as a practical matter, be corrected to a large extent. Systematic study and replanning coupled with the resourceful efforts of organized dairymen in a number of areas have corrected many of the inefficiencies. Where no such effort has been made, and even in most areas where substantial progress has been made, there is every reason to believe that a great deal can be done to conserve vital war materials without depriving dairymen of adequate hauling service.

The Nature of Existing Hauling Arrangements

The first step to be taken in connection with reorganization of the hauling system is to obtain a complete and detailed factual and statistical description of the present system. This description is a valuable research result in itself, but, more important, it provides the basic data for developing the conservation program. In practically all cases, the following information, plus any additional available facts that seem to be pertinent, should be obtained at the beginning:

1. The location of each producer's farmstead and the point at which his milk or cream is loaded on the truck.

2. The daily quantity of milk shipped by each producer during the week or month of highest production, and during the 5 to 6 months of lowest production for the area.

3. The location and the volume of milk or cream received at each receiving plant or station for each month of the year.

4. The exact route followed by each truck, including the producers and the plants served on the route.

5. The nature and load capacity (during different seasons) of each strip of road traveled, including farm lanes or farm roads.

6. The capacity (in terms of milk cans) and nature of truck equipment now used on each route.

7. The age and condition, and probable life or necessary rate of replacement for all existing equipment.

8. The time schedule of each trucker in serving his route.

9. The type of service rendered on each route.

10. The hauling charges paid by each producer.

11. The nature of any formal contractual arrangements or definite understandings and agreements between haulers and producers.

12. The ownership of the trucking equipment and the relation of truck drivers to owners or operators of the routes.

From this information it should be possible to prepare in short order a complete analytical summary of the local hauling system. This summary should include tabular data for each route on size of truck, number of miles traveled, and average load. Such data should be summarized also for the market as a whole. In this way the full statistical story of the present system can be available. 2/

As much as possible of the information outlined above should be shown on a road map or set of road maps. Probably there should be a map for each route, and then an over-all map of the entire area. These maps should be large enough and detailed enough to show exact

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2/ In a number of studies along this line it has been found expedient to prepare a data card for each producer, for each plant, and for each route and hauler. This facilitates analysis of the present system and appraisal of suggested revisions.

locations of farmsteads and the nature of various roads and highways. Through the use of colored pins or tacks, it has been possible in some previous studies in this field to portray the entire hauling arrangement most vividly on a single map. 3/

The securing of the information needed for a thorough analysis and replanning will probably be relatively simple in some areas but seems likely to be more difficult and to take some little time in other areas. As a general rule, it will be impractical to take the time to contact individual producers except those that come to the plant to deliver their own milk, or their own plus that of a few neighbors. Weight records of the plant at which the milk is received should be one of the best sources of data. Such records are usually set up by hauling routes and show many of the figures needed. These records, or satisfactory summaries of them on payroll sheets, may be obtained directly from the plant operators, or in some cases from cooperative associations, Federal market administrators, or State milk control boards or commissions. Cooperative associations in many cases have rather complete records even where they do not operate the receiving plants or pay the producers. The fieldmen of cooperative associations should be a prolific source of information on many of the points mentioned, especially farm locations and type of service. The same is true with respect to health authorities and local inspectors. The haulers or truck drivers themselves, of course, can be relied upon for a substantial part of the information needed.

If any of the agencies are not willing to cooperate in the collection of data, the job is complicated and lengthened, but is not made impossible. It seems quite likely that there will be such cases of unwillingness, both among haulers and among plant operators -- even those who do not own any of the trucks. The alternatives in such cases will be to attempt to overcome their objections by publicity or other pressure, to attempt to secure the data elsewhere, or to spend more time and secure as much of the information as possible through observation and other methods. When the conservation programs are publicized and gain momentum on a national basis, it is believed that much of the local opposition may tend to disappear.

3/ A variety of maps may be available here, such as soil survey maps, quadrangle maps of the coast and geodetic survey, county or State highway maps, and locally or privately prepared plot maps. For planning purposes, it may be desirable to prepare from these a special map showing only roads and dairy farms so as to allow the maximum of analytical data on hauling. As an alternative, it may be feasible to prepare one master map of the area and then to sketch and plan possible revisions through the use of tracing paper. The best procedure in each case will depend on the maps available and the detail with which the analysis is made on the basis of maps.

All governmental agencies -- local, State, and Federal -- will be vitally interested in the development of these conservation plans, and undoubtedly will be willing to cooperate fully in the collection and analysis of data on the existing arrangements. The cooperative should feel free, therefore, to call upon such agencies -- State colleges, extension services, milk control authorities, State departments of agriculture, and the United States Department of Agriculture -- for technical advice and assistance. In the past, it has been possible to spend considerable time in collecting and studying information of this type, but it is believed that with full cooperation on all sides it can be done satisfactorily in very short order. Speed is necessary and desirable in order to stop waste and start the conservation program -- so much so that consideration of speed may outweigh the need for detailed completeness or exact accuracy in many cases.

As indicated above, these factual data on existing hauling arrangements are primarily useful as a basis for planning a new system that uses less equipment and less rubber. Their summary and analysis, however, especially the mapping of routes and the tabulations of average loads, number of trucks, and number of miles, will be a valuable research result. They will be useful in the campaign to get the conservation program under way -- to gain support for it among producers and haulers. They will be especially valuable as a base point from which to measure the savings which the conservation program will make possible.

Planning the Revised System

With all this information available, the job of laying out a more efficient hauling system should be fairly easy. Many of the worst practices have been tolerated merely because the management and the patrons have never had a clear picture of the existing situation. The first step of mapping the routes will ordinarily show many instances where mileage can and should be reduced. For example, on the first mapping of its routes, an Iowa creamery noted that its own truck served a patron $2\frac{1}{2}$ miles off the main route of travel. With the back haul, there were 5 miles of sideroads for one patron. A large patron possibly might have justified the extra time and the added travel, but an examination of the patrons' records revealed that the volume was small--well below the average for all patrons. It was clear that the amount collected for hauling would not anywhere near cover the cost of rendering the service. Further investigation brought out that the patron in question was the hauler's brother-in-law. Illustrations of this kind of inefficiency can be duplicated time and again. No one knows the exact number of cases because only relatively few routes have ever been analyzed so that these things can be discovered. This and other factors which need to be given careful consideration in planning the revised system are discussed in this section.

Combining and Consolidating Loads

It goes without saying that maximum hauling efficiency is attained when full loads are collected in a minimum of distance. After the patrons to be served are determined and after they have been spotted in respect to type of road and volume of production, the next step is to fit the available hauling equipment to the job to be done. In many cases, it would be desirable to switch to larger trucks than those presently being used for main road travel, and perhaps to smaller trucks for certain out-of-the-way areas. But if trucks of ideal capacities are not to be had, the least that can be done is to load existing equipment as efficiently as possible. It is at this point that all the information regarding truck capacities for cans and road types will be needed because these work to limit the extent of the route. Another limit is the amount of milk that can be picked up between the time producers have finished their morning milking and the time the truck must return to the plant. The plan for the new system, therefore, begins with listing the truck capacities, the number of cans to be collected, and the length of the pick-up day.

One point regarding truck capacity must not be overlooked. If it is the body style rather than road conditions or load limits that controls the capacity for cans, definite gains might be made by changing the body. Perhaps double decking will help considerably. This is usually associated with enclosed bodies, which raises a further consideration. Enclosed bodies represent a progressive step and are not to be discouraged. At the same time, many of the enclosed bodies now in use are cumbersome, home-made affairs which are excessively heavy in terms of capacity for cans. Some trucks are near the load limit before any milk or cream is picked up. Thus, whatever the advantages of enclosed bodies (they may be required by ordinance) it should be remembered that they add materially to the cost of hauling because of the extra weight that must be carried. Light yet strong construction is particularly essential.

In laying out the routes for fuller loads, a goal of so many cans for trucks of each capacity might be established. It is necessary, of course, to organize the routes so that the equipment will handle all the volume in the peak season. In the case of cream routes, increased frequency of service tends to take care of the spring and summer flush. Trailers can frequently be used on milk routes to tide over the peak without having expensive trucking equipment either idle or lightly loaded during the short season. At best it is recognized that the average loads will, of necessity, be less than the peak loads. It may be possible in the winter season to transfer more loads from stub routes to larger trucks, with fewer trucks making the trip to the plant. In the summer, on the other hand, all the trucks might have to make the full trip to the plant.

In some areas, the analysis will undoubtedly show that many of the partial loads are the result of a patron having organized a small route in his neighborhood. This condition will have to be eliminated, either by assigning the haulers in question full routes or by discontinuing their services. Closely related to this problem is the more acute situation where patrons deliver their own milk or where it is delivered under exchange arrangements with neighbors. This is given special consideration under the next heading.

Limiting Self-delivery and Exchange Hauling

In instances where truck routes are used to supplement self-delivery or exchange hauling, and this is typical in many manufacturing areas, some real questions arise in connection with establishing efficient routes. Many plants have high-cost routes because their routes are pockmarked with direct delivery patrons. Even if a plant serves an exclusive territory, it cannot have maximum hauling efficiency if half the patrons along the route of travel are passed up because they deliver their own product. And even the most superficial analysis shows that the aggregate hauling mileage is materially greater under self-delivery and exchange arrangements than with well-arranged routes.

An unpublished survey made by the Cooperative Research and Service Division showed these significant facts: The cost of hauling cream with company-owned trucks in an Iowa territory was roughly double the cost of hauling in a Kansas territory of comparable road conditions where the density of production was not much more than half as great. The explanation was briefly this. The Kansas creamery served nearly all the patrons in its territory and all the cream came in on the routes. Each truck served about 80 patrons in a minimum of distance for the territory involved. By way of contrast, about half the producers in the territory served by the Iowa creamery shipped to competing plants and about half the patrons delivered their own cream. Thus the Iowa trucks served about one farm out of four and this condition much more than offset the advantage of relatively denser production.

This is not just an isolated case. From the information available it is a safe generalization that the natural hauling advantage many areas have because of density is lost through self-delivery and overlapping routes. The plants with the most efficient hauling systems today are those that receive milk and cream exclusively on routes. Many have forced this arrangement by paying the same price at the farm as at the plant door. There appears to be two principal reasons for the adoption of this policy. The one, already noted, is that they recognized that hauling efficiency would be enhanced if each truck served all the patrons along its route of travel. The second is that self-delivery disrupts receiving room operations. The no-deduction system is usually associated with large plants and extensive trucking.

In order to handle all the volume that comes in, operations must click in the receiving room. Truck loads can be handled systematically, but if these are interspersed with self-deliveries, operations are slowed up. If delivery is made by women or children, a plant employee may have to leave his regular duties to handle the cans. There is, of course, the further consideration that the plants with ample volume in terms of plant capacity are not particularly concerned about the attitude of a few patrons who insist they should have a differential settlement for delivering their own milk or cream. On the other hand, when a plant is short on volume, it will welcome the direct patron, even at considerable inconvenience.

But these observations regarding the procurement problems associated with direct deliveries do not afford any basis for recommending that the practice be eliminated. Probably many patrons can demonstrate that they make the trip to town anyway because of the school or for some other reason. If they drive a car or truck, the use of rubber and gasoline cannot all be charged against the dairy business. Moreover, it may be that truck capacity is not available to handle all the volume now coming in direct. And the further point is that many of the patrons using the self and exchange delivery system could and will resort to horse-drawn vehicles. Thus the question of what policy to follow in respect to non-route patrons will depend on a number of local circumstances.

Curtailing Service

The time and mileage involved in collecting milk and cream depends to a large extent upon the type of service rendered. Because routes are frequently the property of the haulers and because there is considerable competition among haulers and plants for volume, producers have been favored with a number of high-cost services that might be eliminated in the interest of more efficient assembly systems.

One of the high-cost practices which has become general in many areas is that of rendering milkhouse or farmyard services. At first thought this may seem a relatively unimportant feature of the hauling structure. Actually it affects hauling efficiency in several important respects. In the first place, milkhouse service increases the total distance involved on the route. An analysis of 23 cream routes operated by 11 cooperative creameries in the Midwest showed that lanes accounted for 8 percent of the total route mileage.

But the reduction in mileage does not provide the greatest hauling economies associated with eliminating lanes. Two other considerations are more important. One is that the poorest type of road encountered on the route is the farm lane. Therefore, the lane tends to establish the load limit and prevents the efficient loading discussed above.

Mud and snow-bound lanes may even preclude the use of dual wheels, resulting in less efficient use of many trucks.

The second, and this is the factor of greatest significance, is that farmyard service consumes much of the time required on the route. In the first place, lane travel is relatively slow. For example, the lanes referred to above accounted for 8 percent of the travel distance but more than 17 percent of the travel time. The hauler is slowed up by poor lane conditions, presence of farm animals, and frequently there are gates to open. If the lane is impassible and the producer is accustomed to milkhouse service, he often expects the hauler to walk in and carry the cans out. With roadside collections, this situation could not develop.

Moreover, patrons come to expect other time-consuming services from the hauler. Frequently the morning cream or milk is not ready and the hauler is expected to assist with the dumpting and handling. Or the butter orders are not ready, causing more delay. Then there is the further consideration that under present hauling arrangements the patron is the hauler's customer. The hauler is interested in maintaining his good will and his patronage. So he has to be a good fellow. Once he gets in the farmyard there is usually someone to talk to. In an effort to be friendly, he consumes a minute or more in conversation. On a 60-patron route, an hour is soon lost.

All put together, milkhouse service time requirements are such as to slow up collections tremendously. By contrast, roadside stops are speedy. A much longer route can be covered in the same length of time and larger trucks can be used. Or the same route can be covered in a much shorter time. In fact, the potential savings in time are so great by comparison that many trucks could make a second trip in the same day and be in before the close of receiving time at the plant. With growing shortages of trucking equipment, the importance of this cannot be overemphasized.

It is recognized that with busy days on the farms and a shortage of farm labor, producers may not willingly forego this service. It is a chore to cart milk cans to the roadside. The facts remain, however, that the elimination of this practice would be one of the greatest single steps that could be taken to conserve trucking equipment. It is to be remembered also that these services are largely the product of competition for patrons. In areas where cooperatives have well-organized territories, roadside service is

the rule. Therefore, with some reorganization of territories as discussed later, it should not be as difficult to initiate revised hauling arrangements.

The matter of quality and roadside service is frequently an issue. There are two considerations on this point. One is that with reasonably careful timing, the cans need not set out any great length of time. The second is the time on the route is shortened so much that the opportunity for deterioration on the route is greatly reduced. It is presumed, of course, that a sheltered spot will be provided, preferably on a raised platform.

A closely related problem is that of serving patrons living on side roads. The routes should be examined to determine the type of roads involved, the extent of the back haul and the volume collected from these out-of-the-way patrons. Some cooperatives have established a rule-of-thumb that for every added mile of travel, a minimum of volume must be collected. Producers who fall outside these limits have to bring their cans to the main road or make some other arrangements.

In the case of reduced services of this type, and also that associated with milkhouses, it might be desirable to introduce differential charges into the rate structure to compensate for differential service. For instance, a system may be introduced whereby patrons are charged, say, 15 cents per 100 pounds for milkhouse service and 10 cents for milk set out to the roadside. A few cooperatives now follow this practice. It forces patrons to pay for services in relation to what they cost and induces many to accept less service from the truck. In these times, the differential should be high enough to discourage sideroad and farmyard collections.

Changing Frequency of Collection

Another consideration with service aspects is the frequency of collection. In the case of milk it is assumed that daily collections will be made and frequency problems are avoided. However, in setting up revised cream routes, the frequency of service must be carefully analyzed since this has an important bearing on the mileage involved.

It is simple arithmetic that a 3-trip per week schedule requires 50 percent more travel than a 2-trip per week schedule. But the quality of the cream and the size of the load also depend directly upon the frequency schedule. Accordingly, in planning the revised

system the 3 factors of mileage (cost), cream quality, and truck capacities must be balanced in arriving at the most desirable frequency schedule.

Surveys show that the bulk of all cream routes operated by cooperative creameries are served either 3 or 2 times per week depending on the season of the year and the locality. 4/ Usually the summer schedule is more frequent than the winter. Fortunately for hauling purposes, the peak volume comes in the summer when more frequent collections are necessary from a quality standpoint.

It is not the purpose here to say whether a creamery should use a 3-trip or a 2-trip schedule. The purpose is rather to point out that both of these predominating schedules are somewhat undersirable from the standpoint of hauling efficiency and may need to be discarded. Because there is an odd number of days in the week, each of these schedules introduces uneven intervals between collections. For example, the 3-trip per week schedule is every other day through the week and every third day over the week end. Therefore, the truck capacity must at least accommodate the week end accumulation of cream. Actually this usually means the same number of cans with each one more nearly filled. But by the same token there had to be much unused can capacity through the week.

From the standpoint of quality, every third day is less satisfactory than 3 trips per week. But it might be reasoned that since every third day is involved over week ends anyway, this interval really sets the quality standards for the plant. Moreover, it could probably be demonstrated that it would be more economical to improve the cooling facilities on the farm than to choose 3 trips in preference to every third day. In any case, this change would save 20 percent on cream route mileage.

In some of the high quality areas, 4 trips per week are now being made. In order to avoid the week end carry-over, Friday routes are covered on Saturday, and Tuesday routes are covered on Monday. These should clearly be adjusted to an every-other-day schedule. This would save 13 percent on truck mileage with no loss in quality.

It will be noted, of course, that every-other-day and every third day schedules require Sunday operations. It is undoubtedly for this reason that they have never been widely adopted. While Sunday operations may be objected to from the standpoint of labor and

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4/ Paul E. Quintus. Cooperative Creamery Truck Routes in the United States. Farm Credit Administration, U.S.D.A. Miscellaneous Report No. 52, April 1942.

religious considerations, the farm separated cream creameries should remember that this is universally accepted with whole milk operations. Moreover, the creamery plant can be more efficiently used if the equipment does not have to be large enough to handle week end accumulations. The most efficient plants are used to capacity every day of the week during the flush season.

Rerouting

In addition to the points already made, a thorough job of revamping the hauling system involves systematic planning of the route or routes each truck is to serve. This means naming the patrons and the order in which collections are to be made. Much of the inefficiency in the present routes of travel is the result of the fact that producers in a given area have elected to ship to a given plant merely because a certain hauler was able to "sell" them a hauling service. Haulers for the same plant have frequently built up their routes on the basis of kinship, friendship, religion or some other noneconomic factor. Accordingly, routes have not been laid out with the paramount idea of minimizing either the distance traveled or the collection time.

The strong ties between the haulers and their patrons have also resulted in haulers following patrons to new locations. This is particularly disrupting in areas where tenant operators are numerous. What may have been a reasonably compact route in the beginning may now have several bad spots in it as a result of haulers following the patron uneconomical distances.

Concrete evidence is lacking on the amount of saving to be made by eliminating the overlapping and crisscrossing which is due solely to the fact that adjacent producers have selected different outlets, without changing the market outlets of producers. If the producers cannot be shifted in respect to plants, it should at least be possible, as a practical matter, to have a single truck make deliveries to one or more plants, particularly if the competing plants are in the same market. This is done now in many fluid milk markets. It should be possible also to have trucks exchange part of their loads at agreed points, thus avoiding duplication on the pick-up and on the unloading job.

If the idea can be established that haulers are merely providing a transportation service for an area rather than serving particular patrons and particular plants, further opportunities for saving will undoubtedly come to light. Reorganization along these lines has been studied for Orleans County, Vermont, and the possibility of substantial economies was apparent.

Reallocating Producers

In the final analysis, maximum conservation of rubber and trucks cannot be attained without controlling the trade areas served by each plant. In fact, in many areas, a reallocation of patrons would be the most important single step that could be taken to reduce truck mileage. Looked at in this light, what has been said above in respect to consolidating loads, reducing services and rerouting are all in the nature of refinements to be introduced into the hauling system after the territories to be served are properly established.

It is recognized that the problems associated with disrupting long established producer-plant relationships are tremendous. But the obstacles are more than matched by the importance of getting the job done. Thus, however drastic the change may seem, concerted effort must be made to correct these situations, at least for the duration of the emergency.

Those charged with planning the revised system will encounter objections because of real or apparent price differences between outlets, because of quality considerations, because fixed outlets give the dealers certain monopolistic powers, because producers value the financial stability of particular dealers or outlets and because relationships between producers and their cooperatives will be disrupted. Many of these relationships are of long standing and involve financial investments as well as marketing contracts. Quality standards and regulations vary between separate milk markets, between milk markets and manufacturing plants and even between different manufacturing plants. In some areas, the sale of farm separated cream and whole milk to different outlets presents another obstacle.

The notion of establishing exclusive zones or boundaries around individual plants also raises some serious economic questions. This is particularly true of the manufacturing areas. In the first place, it would be extremely difficult to establish boundaries where large and small plants and plants of different types operate in the same territory. More important, any scheme of allocating producers would work to destroy competitive safeguards and prevent volume from eventual concentration in the most efficient plants.

The least favorably situated plants - those that are now about to yield to competitive pressures - would, of course, welcome any arrangement whereby they were assured of their present volume without fear of intrusion by outsiders. Thus the danger of allocation here is that of perpetuating organizations which are unable to meet

legitimate competition and which should be dissolved, at least under normal circumstances, in the interests of a more efficient marketing system.

The fact still remains, however, that reallocation of patrons will conserve trucks and rubber. And there are numerous instances where it could be brought about without any particular conflict with the economic considerations just mentioned. There are, for example, a number of instances where several large and efficient plants making the same product serve essentially the same territory. Under these conditions it is likely also that they pay about the same price. The total available volume is sufficient for each of the plants to operate near the lowest cost reasonably attainable, yet the over-all efficiency of each plant is lowered because of overlapping hauling structures. Where these situations are found, there is certainly a clear case for reallocation of patrons. The critical situation in respect to trucking resources leaves no excusable alternative.

There are also known to be many more instances in which the principal trade areas are now pretty well defined for each plant but where there is excessive overlapping on the fringes. It is in these outlying zones where the most hauling waste occurs. Here, again, the overlapping could and should be eliminated. It is not necessarily a question of perpetuating inefficient plants since there may not be too many plants in the area under consideration.

To return now to the case of the relatively inefficient plant and other cases where there may be distinct economic disadvantages associated with zoning territories, it appears necessary to appraise these from both a long-time and an emergency viewpoint. Considering the long-run first, it is easy to conclude, for example, that there are too many cheese factories and too many creameries. However, this is probably not the time to expedite the elimination of plants which were clearly superfluous in normal times. In the first place, the expanded production necessitated by the war requires the productive capacity of these normally questionable plants. Also, proposals for the elimination of inefficient plants generally contemplated that they would be replaced by expanded facilities of more modern design at another point. The war economy virtually precludes the latter possibility. In any case, it would be a questionable national policy if this were permitted.

Still more important from the standpoint of the conservation program, the greater the number of plants (receiving points), the greater the possibility of reducing truck mileage. In fact, there are areas in which the plants are so numerous that a return to horse-drawn vehicles is entirely feasible.

In the older butter areas many plants frequently receive the equivalent of less than one full truckload of cream per day. Yet one or two small truck routes may be operated to offset loss of volume to another creamery or creameries using trucks. The result is a pattern of crisscrossing small routes over an expanded territory. If each creamery were forced back to the farms nearest its plant, its present volume could be obtained from close-in farms. In Butler County, Iowa, to illustrate this point, a typical small creamery had 123 patrons, 87 of which were served on 4 truck routes, with the farthest patron 12 miles away. The same volume could have been obtained within just over 3 miles of the plant - well within the range of self-delivery or of horse-drawn delivery equipment.

The question of denying free choice of outlets on the part of patrons and likewise of denying plants to choose patrons remains as a major obstacle. It is particularly acute in instances where firms would be permitted to exploit patrons because of inefficient plant operations. It is possible, however, that certain operating inefficiencies would disappear under a system of patron allocation. One reason for high costs and low pay-out prices is the cost of rendering high cost services in an effort to hold volume. If volume were assured, many of these costs could be eliminated and the prices paid producers could be increased. If the same advantage accrued to the larger plants, the differential situation would not be altered. But those plants that have an adequate volume in relation to plant capacity presumably would have fewer opportunities to reduce costs under the new situation.

It is probable also that through technical assistance and educational means, appropriate agencies could assist the high cost plants in overcoming some of their deficiencies. In extreme cases, assuming the proper authority was established, it might be necessary for State agencies to take over certain plants during the emergency, either to operate them or to close them.

In many fluid milk areas the savings through reallocation, while substantial, will be much less than in manufacturing zones. A given group of producers supply the market and they cannot be readily interchanged with producers supplying other fluid markets or with patrons of manufacturing plants. This does not mean that some degree of reallocation may not be warranted as an emergency war measure, especially in those areas where the present arrangement is grossly inefficient and where major saving in hauling equipment cannot be made in a less drastic manner.

In connection with allocation of patrons, some of the experiences in New Zealand are of interest. Because the situation was more acute there and the leadership was unified and aggressive, exclusive zones

have long since been established around each of the dairy plants that were permitted to remain in operation. In commenting upon the success of this program, a New Zealand official reports that "Though at first there was some opposition on the grounds that (a) the liberty of the individual was being interfered with, (b) 'competition was the soul of business,' and (c) zoning would lead to inefficiency on the part of the companies, the system has now been wholeheartedly accepted by the dairy industry, and a reversion to the old system would be universally opposed." 5/ Incidentally, New Zealand controls its milk and cream routes through a licensing system. The routes where trucks are permitted to go are first laid out and a franchise is then given to one truck to operate each route. There is no duplication on the routes covered and patrons living off the licensed routes must deliver their milk or cream to the nearest route. Milkhouse service never developed there so there was nothing to eliminate on that score. Whenever a licensed route parallels a railroad in returning to the plant, the load must be transferred to rail cars.

These references are not necessarily to suggest the adoption of the New Zealand system, but rather to call attention to possible solutions that can be worked out under extreme pressure for conservation.

Drafting the Revised System

Changes along all of the lines discussed earlier in this section will probably be necessary in order to bring about the maximum conservation of tires and trucks. Larger loads, fewer self-haulers, less special service, more direct routing, and less overlapping of trade areas or milksheds should all be characteristics of the revised system as compared with the old.

In order to do the most effective job of laying out or planning this revised system with all of the changes that will be called for, it is believed that a distinct research point of view must be adopted. With complete data available, the first step in the replanning job should be to forget for the moment everything except where the farms are located, how much milk or cream there is at each farm, where the plants are located, how much milk or cream each plant receives, and the location and condition of the roads. Starting with these data, and using trucks which will hold 100 or 120 10-gallon milk cans or the largest capacity truck which road conditions will permit, a complete assembly system should be laid out.

5/ Letter from R. D. Freel, Secretary, Executive Commission of Agriculture, Dominion of New Zealand, January 1941.

This system could be called the "ideal" system. It should be laid out fairly rigidly under relatively uniform provisions for the area. For example, it should provide that each truck carry a full load in the peak season, that each producer's milk or cream be sent to the nearest plant, that each truck serve an exclusive territory, that every producer except those very near the plant (say within 2 miles) be required to ship on the route, that subroutes or pick-up routes be used on the poorer roads, and then their load transferred to a larger truck at the main road, that no producer be given milk-house service unless he has a large volume per day or unless other special conditions make main road pick-up inadvisable, and that frequency of service and the time of unloading at the plant be arranged independently of present plant operating practices.

This "ideal" system may not be practical enough to adopt except in a few areas where there are only a few minor obstacles to be overcome. It will be extremely useful, however, in planning a practical system. Essentially, it will serve as the method of determining the revised system - will insure that the new system is a provable research result of definite analysis rather than the "hit-or-miss" answer that may have been arrived at through a less formal approach.

The number of trucks and the number of miles traveled in covering this "ideal" system should be measured carefully. These figures will serve as the base point from which to measure the physical cost, or the conservation cost, of modifying the system to a more practical or agreeable basis. If monetary cost figures are available, they should be calculated also, since one of the most convincing arguments to present to producers will be the reductions in hauling charges which the new system makes possible.

The second step in drafting the revised system which will be placed in operation is to modify the "ideal" system to whatever extent is necessary in order to meet peculiar conditions and to recognize obstacles which appear to be insurmountable. Undoubtedly the first necessary modification will be to fit the routes to the capacities of the trucks that are now being used for hauling milk or cream in the area. Obviously the larger trucks should be used as long as they last, the largest trucks should be assigned to the better roads, and any minor body changes which could be made to increase the can capacity of existing trucks should be included in the reckoning. The cost of using these smaller trucks should be measured in terms of additional drivers, additional miles, and additional trucks, as compared with the ideal system.

Perhaps the next modification will be to provide that a number of the producers will not be shifted from their present sales outlet

to the plant nearest their farm. As indicated in the discussion earlier in this section, there will doubtless be many cases in which such shifts will cause rather serious dislocations without saving a significant amount of travel. In order to facilitate getting the plan into operation and in order to reduce administrative difficulties, it will probably be advisable at the outset to recognize many of these special cases. The cost of making these modifications should be measured, however, so that they may be reconsidered if it becomes necessary at a later stage to adopt more rigid conservation methods.

Other modifications in the "ideal" system may be necessary in various local areas in order to make the system practical and workable, but at each step the cost should be measured and balanced against the benefit. The cost in each case is a sacrifice in conservation, while the benefit is less disruption of present arrangements and greater likelihood that the revised system can be put into operation without difficulty.

In all of this planning work - developing the ideal system and then modifying it to recognize particular local conditions - there are a number of considerations or principles which should be kept firmly in mind. The paramount objective of the replanning is to conserve rubber and equipment by eliminating waste and inefficiency. In order to do this effectively, it will be necessary to think in broad over-all terms, to think in terms of the area as a whole, to think of hauling as a service that is separate and apart from other phases of marketing. The job, then, will be to plan an efficient hauling service for the area, and it is believed that this can be done best by laying out new routes rather than by seeking gradually to improve the existing routes.

While the changes that will result from a well-planned conservation program will eliminate many undesirable market practices, it is important to emphasize that the objective is not market reform. The program will be weakened to the extent that any group attempts to shape it in the direction of special reforms it may be seeking. Such changes, while desirable, are definitely secondary for the moment to the conservation objective.

It is important to stress again the need for speed and for wide approval or acceptance of the plan, so that it may be put into operation quickly. Every type of revision, therefore, should be appraised in terms of how much rubber and equipment it saves as well as in terms of how can it be put into operation. Plans must be workable in terms of local conditions.

Putting Revised Plans Into Operation

The completely revised hauling or assembly plan should be mapped and summarized, statistically and otherwise, in even more detail than the existing arrangements. Each route should be laid out accurately to indicate the producers to be served and the type of service to be given. The size of the pay-load on a seasonal basis should be shown, as well as the approximate time to be spent in covering the route, and the arrangements for exchanging loads, for unloading the milk or cream, and returning the empty cans.

If a revised plan has been devised through the cooperative efforts of representatives of producers, plant operators, and haulers, it may be possible to put it into effect without a great deal of trouble. However, it seems probable that those revised plans which call for major savings will by this same token displace a number of trucks and driver, switch producers to new routes, and in some cases to new plants, reduce the service to producers, and change the time of arrival at some plants. On the other hand, of course, it should be possible under the conservation program to reduce hauling rates, raise the net incomes of haulers, save rubber and trucks, assure producers and dealers of hauling service for a longer period, and assure haulers of a job for a longer period.

Thus, there will be understandable grounds for individual objections but there will be strong arguments to use in attempting to secure industry acceptance and producer acceptance of the revised plan. In any case, administration promises to be the major job in most areas. This job will call for the full ingenuity of the cooperative, including attempts again to secure the collaboration of all agencies -- governmental and otherwise -- in getting the plan approved and adopted.

The methods used by cooperatives and others to reorganize local hauling in the past have varied all the way from central ownership and operation of the entire system to informal negotiations with the haulers coupled with educational work among producers. Basically, of course, the producer has the right to say who shall haul his milk and to determine the charge to be made for the service. Either by formal marketing contract or by definite understanding, this right is frequently transferred to his cooperative association or to the agency receiving his milk. In any case, these rights or transfers of authority need to be clarified before any program is started.

As a first approach to the problem in case these rights have not been assigned to any cooperative or hauler or plant operator, the producers to be served on each of the new routes should be called together for the purpose of organizing to exercise their control. If they are in accord with the new plan, their main job will be to select a hauler and to negotiate the hauling rate. In areas where this plan has been used, producers on the route have usually selected a committee

to perform these functions. Both the rate and the hauler have often been determined, then, on the basis of competitive bids submitted by haulers. Bids are submitted under specifications which call for the signing of a contract which clearly stipulates the type of service and other pertinent factors. It is important to point out that the lowest bids have not been accepted in all cases, since a number of factors such as character and type of equipment are essential to satisfactory service.

This procedure of allowing producers on the route to administer the hauling arrangements is being used successfully in several market areas, even in areas where marketing contracts clearly transfer to the cooperative marketing association or the plant operator the right to designate the time, place, and method of delivery. It has the important advantage of promoting satisfaction and understanding among producers by giving them full authority and full knowledge regarding hauling arrangements.

In many cases this organization or meeting of producers on the route may lead to the formation of a trucking cooperative among the producers to own and operate the truck. A corporation may be formed to purchase and operate the truck, a salaried driver employed, and the organization operated by a board of directors selected among the producers. The rate should be established at a level which adequately covers all costs, including adequate depreciation and full insurance of every kind, and then all income over costs returned to producers in proportion to their volume.

Several such cooperatives have been formed in this manner, and are operating with a high degree of success. One of the most recently organized trucking associations is now functioning in the St. Louis milkshed among the members of the Sanitary Milk Producers, the large bargaining cooperative in that market. The latter association helped the trucking cooperative with its organization problems and has provided some assistance with respect to initial finances. Other hauling cooperatives of this type have been functioning in Maryland for several years.

This type of cooperative approach to milk or cream hauling is not suggested as a universal or exclusive method of putting conservation programs into effect, largely because the time is not available to do the necessary educational and organizational work to insure full support and understanding of the new cooperatives by their producer-members. As with all other forms of agricultural cooperation, it cannot be expected that hastily formed organizations, set up largely on the basis of initiative from an outside or overhead agency, will be universally successful. This does not mean, however, that the job needs to be done as slowly as in peace time. Undoubtedly much can be done to stimulate the formation of new associations of this type,

but probably such efforts should be confined to sections where leading producers are favorable to such a plan and are willing to spend considerable time getting the association started.

If the authority to arrange for hauling service can be transferred to or is already in the hands of the existing marketing cooperative, there are several ways in which the reorganization scheme may be placed in operation. The most direct method, of course, is for the association to take over complete ownership and operation of the trucks, employing salaried drivers to operate them. Such a step insures complete unified control, uniform service, rates based on actual cost, speedy inauguration of a conservation program, and probably lower operating costs through large-scale buying of gasoline and other supplies. Such a step requires considerable financial investment, however, and it also may mean many new problems for the associations without operating experience. One important factor on the cost side is the probability that independent truck operators probably make less net income than the salaries which the cooperative would be forced to pay its drivers, especially if they become unionized. Full ownership may well be the best approach, however, in many areas, especially where the association is already in the operating field and perhaps already owns a limited number of trucks.

Where milk dealers or plant operators or trucking companies now own and operate the trucks, it should be possible through their joint control to place the conservation program into operation through a negotiated agreement to continue the existing division of the business on a proportionate basis. Such arrangements should probably be cleared with anti-trust authorities to avoid later difficulty. Despite this difficulty, however, such an arrangement has the advantage of focusing attention on the conservation features of the program rather than complicating it by introducing at the same time a change in the pattern of ownership and control of the hauling system. If real savings in trucks and mileage are brought about by the program without changing the volume of receipts at any plant and without depriving these agencies of their control over hauling, there would seem to be little reason for reluctance to accept the program.

About the only practical alternative to cooperative ownership and operation where the trucks are largely owned individually by the haulers is the use of formal hauling contracts whereby the association contracts with private truck owners or operators to perform specified services on clearly specified routes serving designated producers. If the cooperative retains this degree of control -- that is, route to travel, producers to be served, type of service to be given, and point of unloading -- then the revised plan may be put into operation almost as quickly and as completely as with full cooperative ownership. Haulers can be selected and hauling rates established on the basis of negotiation combined with competitive bidding, thus working towards satisfactory service at low cost.

In all of these operating procedures there are a number of problems that must be faced in connection with the drivers and the trucks that are displaced, in connection with the reduced service to producers, and in connection with the changes that are made in the direction of shifting producers and haulers to new plants.

In many areas it appears to be generally conceded that the haulers have some equity or good will value in the routes which they have built up over a series of years. Expediency as well as satisfaction among producers -- many of whom are probably relatives or close friends of the hauler -- may be best served by compensating displaced haulers for this equity. Almost always the revised plan will allow hauling rates to be lowered by enough to offset in a very short time any cost incurred along this line. An organized effort to displace first those haulers that have entered the business most recently, or to find other suitable jobs for the displaced haulers, will undoubtedly help to solve this problem. It is expected, also, of course, that it will be the least valuable routes that will be eliminated first, and that the haulers who remain may be willing to "buy out" some of the others.

Under some circumstances it may be questionable whether the hauler actually has any equity in his route above the value of his equipment. It is probably desirable, from the long-run point of view, not to concede the existence of a good will value under such circumstances. However, in order to get the program started quickly, it may be expedient to compensate haulers for giving up their routes even in instances where their right to such payments may not be clearly established.

It may be necessary and desirable to purchase contract releases, particularly where there are already formal contracts between producers and haulers or between cooperatives and haulers, and to a lesser extent where there are informal but definite understandings without written contracts.

Equipment released through consolidation of routes will probably not be difficult to dispose of, particularly after the shortages become more critical and a heavier demand for trucks and tires develops. In any case, if there is some centralization of control under the reorganization plan, it should be sound policy to purchase the equipment which is not needed under the new route plan and to hold it in reserve until present equipment wears out. As an alternative, it could be rotated with existing equipment so that both might last longer. Here again the lower hauling rates should easily offset the cost of purchasing this equipment

The other problems mentioned above -- reduced services to producers, and changing the plant or marketing outlets of producers and haulers -- can be minimized in several ways: (1) By bringing all of the affected parties, or representatives of them, into the active formulation of the conservation program so that they understand the problem and have a voice in determining a practical solution; (2) by an intense educational effort based on the figures showing the savings that can be made by putting the program into operation; (3) by establishing distance differentials in hauling rates so as to encourage shipment to the nearest plant; and (4) by exercising extreme care and judgment in developing the program so as to avoid as far as possible especially radical changes for particular individuals or groups.

In some areas, a full conservation program will undoubtedly call for such drastic changes as to create an extremely difficult problem on the matter of shifting producers to the nearest plant. It may be necessary in such cases to make special arrangements, such as making the shift with the full understanding that it is effective only for the duration, or having the existing plant outlet collect for the milk or cream from the new outlet and continue as at present to make the payment to the producer. This latter type of arrangement might be especially desirable where members of cooperatives are shifted under the conservation program to a private plant operator or to another cooperative. Where a cooperative receives milk or cream from nonmembers in this fashion, it would be necessary to handle it in such a way, of course, as to avoid prejudicing income-tax exemptions.

It is important to emphasize in connection with all of these problems the desirability of developing the program from the outset with the view to making it reasonable and practical to put into operation. This means balancing savings against obstacles and savings against disruption of existing relationships at every turn. It also means bringing into the program from the beginning all agencies that are to be affected, and attempting to develop with them a mutually satisfactory program.

Again, however, it should be realized from the beginning that significant conservation will inevitably call for significant changes in the present hauling arrangements, and that the need for speed is one of the prime considerations. If cooperatives are to fulfill their responsibility for leadership on this important problem, therefore, they must expect that some of these difficulties cannot be avoided. They are a necessary part of doing a thorough job in a short period of time.

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